

Table 1¹
FOSSIL FUEL TERMINALS AND REFINERIES,
PROPOSED FOR CONSTRUCTION OR EXPANSION²

Terminal or Refinery/Location (North to South)		Proposed Vol. (bpd ³ or mmta ⁴)	Possible Additional Unit Trains per Day (one way)	Possible Additional Vessels per Annum ⁵ (one way)
Puget Sound				
1	Westridge Marine Terminal, ⁶ Burnaby, BC	590,000 ⁷ bpd	n.a.	348 ⁸
2	Ridley Terminals, ⁹ Prince Rupert, BC	13 mmta ¹⁰	2 ¹¹	n.a. ¹²
3	Neptune Terminals, ¹³ Vancouver, BC	6 mmta ¹⁴	1 ¹⁵	52 ¹⁶
4	Fraser-Surrey, ¹⁷ Vancouver, BC	8 mmta ¹⁸	1.3	40 ¹⁹
5	Westshore Terminal, Vancouver, BC	6 mmta ²⁰	1	104 ²¹
6	Gateway Pacific Terminal (coal), ²² Ferndale, WA	48 mmta ²³	9 ²⁴	487 ²⁵
7	BP Cherry Point Refinery, ²⁶ Blaine, WA	71,500 bpd	1 ²⁷	33
8	Phillips 66 Refinery, ²⁸ Ferndale, WA	35,750 bpd	0.5 ²⁹	17
9	Tesoro Refinery, ³⁰ * Anacortes, WA	50,000 ³¹ bpd	1 ³²	36
10	Shell Refinery, ³³ Anacortes, WA	61,286 bpd	1 ³⁴	45
11	U.S. Oil & Refining Co., ³⁵ Tacoma, WA	40,000 ³⁶ bpd	0.6	29 ³⁷
12	Targa Sound Terminal, ³⁸ Tacoma, WA	30,000 ³⁹ bpd	0.4	22 ⁴⁰
Total Possible Additional Vessels in the Puget Sound (2012 traffic: 6272)⁴¹				1213
Grays Harbor, Hoquiam, WA ⁴²				
13	Imperium Bulk Liquid Terminal, T1 ⁴³	68,250 bpd	1 ⁴⁴	200 ⁴⁵
14	Westway Terminal Co., T1 ⁴⁶	28,692 ⁴⁷ bpd	0.4	60 ⁴⁸
15	Grays Harbor Rail Terminal, T-3 ⁴⁹	50,000 ⁵⁰ bpd	0.7	54 ⁵¹
Total Possible Additional Vessels in Grays Harbor (2012 traffic: 82)				314
Columbia River ⁵²				
16	Oregon LNG, ⁵³ Warrenton, OR	9 mmta	n.a.	125 ⁵⁴
16	Millennium Bulk Logistics (coal), Longview	44 mmta	7.4	850
17a	Port of Morrow, ⁵⁵ Boardman, OR (coal)	8 mmta	1	624 barge tows
17b	Port Westward, Clatskanie, OR	See 17a	n.a.	156
18	Vancouver Energy Dist'n Term., ⁵⁶ Pt of Vancouver	360,000 ⁵⁷	5	386
19	Columbia Pacific Bio-Refinery, ⁵⁸ Port of St. Helens, Port Westward Industrial Park, Clatskanie, OR	28,600 ⁵⁹	0.4	31
Total Possible Additional Vessels on the Columbia River (2012 traffic: 1422)				2172
Total Possible Additional Trains (one way)			35.2	

¹ Compiled by Protect Whatcom. Table updated as of October 17, 2013. Numbers on info graphics are based on known information at the time of printing, and may not be consistent with this table.

² General information Source: <http://www.petroileumnewsbakken.com/>.

³ "BPD" is barrels per day. A barrel of crude is 42 U.S. gallons or 158.9873 litres.

In some cases, volume is extrapolated from train numbers. We assumed 110 rail cars/train, each carrying an average of 650 bbl (range is 600-700 bbl), for a total of 71,500 bbl/train unit. See Ass'n of American Railroads, *Just the Facts – Railroads Safely Move Hazardous Materials, Including Crude Oil*, located online 8/30/13, at <http://www.portofgraysharbor.com/downloads/crude-by-rail/Facts-on-Hazmat-and-Crude-Oil-Safety.pdf>.

⁴ Mmta = metric tonnes per annum. A metric tonne is approximately 1.1 short tons.

⁵ Vessels are bulkers of the Panamax or Cape class; tankers of the Panamax class; and LNG (liquid natural gas) carriers of equivalent size as Panamax tankers and bulkers. Not counted are bunker barges which will fuel vessels at dock. For every two large vessels, estimate one bunker barge transit. Source: *Minutes, Combined Meeting, Steering Committee of the Puget Sound Harbor Safety Committee and Puget Sound Partnership Oil Spill Work Group, Vessel Traffic Risk Assessment (VTRA), Draft Estimates, Notes and Decisions on Future Scenarios*, May 2, 2013 (rev. 5/7) (hereafter "5/13 PSP VTRA Est."), located online Oct. 15, 2013, at http://www.psp.wa.gov/downloads/OILSPILL/VTRA_SC_Decisions5_2_13Final.pdf.

Unless otherwise specified, the following assumptions were made:

- Crude received will leave terminals and refineries in its unrefined state, by vessel and not by rail or the Olympic pipeline;
- Crude volume received is roughly equivalent to volume of refined product. In fact, volume of refined product is actually slightly higher. Source: telephone conversation with Julie Harris, Refinery Operations, US DOE EIA, 2032-586-6281. See *Petroleum & Other Liquids, Data, Refinery Yields*, US Energy Information Administration, http://www.eia.gov/dnav/pet/pet_pnp_pct_dc_nus_pct_m.htm.
- At Tacoma, Grays Harbor, and Columbia River terminals, crude will leave by some combination of (a) oil tankers with a maximum draft of 40' and capacity of 340,000 bbl ; and (b) articulated tug/barge combo, with an 85,000 bbl-capacity barge (they range from 55-150,000 bbl). Vessel estimates in the table represent only tankers of the largest class, and not barges, unless other source information is cited.

⁶ Proponent Kinder Morgan Canada Terminals LP. The Kinder Morgan Pipeline serves multiple facilities including the Westridge Terminal, BP Cherry Point, Phillips 66 Ferndale, and the Tesoro and Shell refineries in Anacortes. *TransMountain Pipeline & Puget Sound Pipeline: Connected Delivery Terminals and Refineries*, located online Aug. 31, 2013, at http://www.kindermorgan.com/business/canada/delivery_receipt_locations.cfm.

⁷ According to the proponent's website, the Trans-Mountain Pipeline Expansion project would increase capacity from 300,000 to 890,000 bpd. Accessed online Oct. 17, 2013, at http://www.kindermorgan.com/business/canada/tmx_expansion.cfm.

⁸ Kinder Morgan Canada, *Trans Mountain, Tanker Traffic*, located online Oct. 17, 2013, at <http://www.transmountain.com/tanker-traffic>.

⁹ Proponent website: <http://www.rti.ca/>. Ridley is an existing coal terminal with plans for expansion.

¹⁰ The terminal plans to expand from 12 to 25 mmta. <http://www.rti.ca/terminal> (accessed Oct. 17, 2013).

¹¹ Ridley's rail map for coal routes from the Powder River Basin bear no relation to current lines. See <http://www.rti.ca/sites/default/files/shippingcommodities.png>. They seem to be saying coal would go to the coast through Stevens Pass, but loaded trains are too heavy for the grades in the Cascade Mountains, and loaded trains all go west through the Columbia River Gorge. Returning empty trains could use Stevens Pass until it reaches capacity. The more direct route, north from the PRB to Calgary, and north by northwest via Canadian National, is not favored by BNSF.

¹² Ships from Ridley Terminal have direct access to the Pacific Ocean and do not add traffic in Puget Sound. They do, of course, add traffic on the Great Circle Route to the Pacific Rim.

¹³ The permit for this coal terminal's expansion was granted in January 2013. See terminal webpage: <http://www.portmetrovanancouver.com/en/projects/OngoingProjects/Tenant-Led-Projects/neptune-terminals-upgrades-coal-handling-expansion>.

¹⁴ Information from terminal website, accessed Oct. 17, 2013, at <http://www.portmetrovanancouver.com/en/projects/OngoingProjects/Tenant-Led-Projects/NeptuneTerminals.aspx>.

¹⁵ *Vancouver Fraser Port Authority Environmental Assessment Report and Schedule of Environmental Conditions*, Port Metro Vancouver VFPA Review No. 12-066, p.1, Jan. 23, 2013, located online Oct. 17, 2013, at <http://www.portmetrovanancouver.com/docs/default-source/projects-project-review/2013-01-23-project-permit---signed-with-plans-and-schedule---neptune-coal-capacity-pp-2012-066.pdf?sfvrsn=0>. Note that this projection assumes trains 152 cars long, versus the current average of 125 cars. *Port Metro Vancouver Neptune Bulk Terminals – New Stacker Reclaimer Project and Additional Coal Handling Improvements January 2013 – Input Consideration Memorandum*, p.4, located online Oct. 17, 2013, at http://www.portmetrovanancouver.com/docs/default-source/projects-project-review/january-2013_final_neptune-project-input-consideration-memo.pdf?sfvrsn=0. Total terminal capacity after proposed expansion would be 18.5 mmta. *Id.* at 2.

¹⁶ According to the 5/13 PSP VTRA Est. http://www.psp.wa.gov/downloads/OILSPILL/VTRA_SC_Decisions5_2_13Final.pdf, there would be a total additional 176 vessel calls per year, for all commodities and docks at Neptune. Vessels associated with expansion for met coal will be one additional vessel per week. *Vancouver Fraser Port Authority Environmental Assessment Report and Schedule of Environmental Conditions*, Port Metro Vancouver VFPA Review No. 12-066, p.1, Jan. 23, 2013, located online Oct. 17, 2013, at <http://www.portmetrovanancouver.com/docs/default-source/projects-project-review/2013-01-23-project-permit---signed-with-plans-and-schedule---neptune-coal-capacity-pp-2012-066.pdf?sfvrsn=0>.

¹⁷ Proponent website: <http://www.fsd.bc.ca/index.php/company/community-outreach/>. Port Metro Vancouver conducted a River Tanker Traffic Study completed June 2012. See generally <http://www.portmetrovanancouver.com/en/portusers/marineoperations/navigation/tanker-traffic>. Study located online Oct. 17,

2013, at http://www.portmetrovanancouver.com/docs/default-source/port-users-marine-operations/Fraser_River_Tanker_Traffic_Study_Full_Report.pdf?sfvrsn=0.

¹⁸ *Fraser Surrey Docks, Risk Assessment Study for Coal Barge Operation*, Report No./DNV Reg.No.: PP050173/1-5EZEXO, Rev. 2A, 2012-09-26, p.1, located online Oct. 17, 2013, at http://www.fsd.bc.ca/documents/coal/marine_risk_assessment.pdf.

¹⁹ 5/13 PSP VTRA Est. http://www.psp.wa.gov/downloads/OILSPILL/VTRA_SC_Decisions5_2_13Final.pdf.

²⁰ See <http://www.platts.com/latest-news/coal/washington/vancouvers-westshore-terminal-coal-exports-increase-21394473>.

²¹ 5/13 PSP VTRA Est. http://www.psp.wa.gov/downloads/OILSPILL/VTRA_SC_Decisions5_2_13Final.pdf.

²² MDP2011-000001/SHR2011-00009, *Pacific International Terminals, Inc. Major Project Permit and Shoreline Substantial Development Permit Supplemental Applications – Supplemental Information* (hereinafter “GPT Permit App.”), March 16, 2012, located online Oct. 15, 2013, at <http://www.co.whatcom.wa.us/pds/plan/current/gpt-ssa/pdf/20120319-permit-submittal.pdf>. Status: Scoping closed for the Draft Environmental Impact Statement January 22, 2013; the Scoping Report was issued March 29, 2013.

<http://www.eisgatewaypacificwa.gov/resources/scoping-report>. Comments may be viewed online at

<http://www.eisgatewaypacificwa.gov/get-involved/comment/all>.

²³ *GPT Permit App.* at Table 4-2, p. 4-51.

²⁴ *Ibid.* at Table 4-5, p. 4-55.

²⁵ *Ibid.* at Table 4-6, p. 4-63.

²⁶ Proponent BP West Coast Products, LLC. County permits were approved for rail expansion on October 18, 2012, after a SEPA threshold review resulted in a mitigated determination of nonsignificance. See case No. SEP2012-00059 at <http://whatcomcounty.us/pds/plan/sepa/2012-quarter4.jsp>. For a general description of the facility, see BP Cherry Point, http://www.bp.com/content/dam/bp/pdf/abp_wwd_us_cherry_point_fact_sheet_june_2011.pdf.

Pending from the Wash. Dep’t of Ecology: Water Permit Draft NPDES WA-00-2290-0. **Comment period opens 9/4/13, and closes 10/7/13.** For information: public disclosure coordinator Ann Lowe via E-mail or phone (360) 407-6916.

<http://apps.ecy.wa.gov/industrial/proposed.asp>.

²⁷ Cascade Engineering Group, P.S., Inc., *Rail Logistics Stormwater Site Plan*, p.1, Aug. 16, 2012, located online 8/31/13, at <http://whatcomcounty.us/pds/plan/sepa/pdf/sep2012-00059-sepa-packet-mdns-20121018-part2.pdf> at 83/164 (“The facility will be designed to transfer a variety of train sizes (up to and including one unit train per day).”).

²⁸ Proponent Phillips 66 Co. Ferndale Refinery. Permits were approved for rail expansion on Apr. 29, 2013, after a SEPA threshold review resulted in a mitigated determination of nonsignificance. See case No. SEP2013-00005 at <http://whatcomcounty.us/pds/plan/sepa/2013-quarter2.jsp>.

²⁹ Whatcom County Planning & Development Services SEPA Mitigated Determination of Nonsignificance, p.4, Apr. 29, 2013, located online 8/31/13, at <http://whatcomcounty.us/pds/plan/sepa/pdf/sep2013-00005-sepa-packet-mdns-20130429.pdf> at 2/40 (“The project will add up to one unit train every other day, on average on an annual basis....”).

³⁰ Proponent Tesoro Refining & Marketing Co./KM/BNSF. Refinery website: <http://www.tsocorp.com/tsocorp/productsandservices/locations/refinerylocations/001545>.

³¹ See *id.* The terminal manager states publicly Tesoro refinery receives only 50,000 bpd, but that number is very low given they receive 6 trains per week. We assume industry average volume per train and applied that number. This terminal states it can receive no more than 120,000 total bpd from all sources—Alaskan and Bakken crude, and Canadian tar sands by pipeline.

³² This facility receives Bakken crude now. Mark Stayton and Kate Martin, *Shell considers rail loop for Bakken crude*, goskagit.com, Mar. 30, 2013, located online 9/1/13, at http://www.goskagit.com/all_access/shell-considers-rail-loop-for-bakken-crude/article_117f6919-350e-539d-b38d-4c8bb694aebf.html (quoting terminal manager stating they receive 6 trains per week).

³³ Proponent Shell Oil Products US. Pre-application filed (see fn. below). Skagit County POC: Will W. Honea, willh@co.skagit.wa.us.

³⁴ *Shell Puget Sound Crude by Rail East Gate Project, Anacortes, WA, Pre-Development Meeting* “Project Description” at p.3 of attachment **filed Aug. 22, 2013**, located online 8/31/13 at <http://www.scribd.com/doc/163737250/Shell-SkagitCounty-PreDevelopmentMeetingApplication-2013-08-22> (“At this early stage the project plans to handle about one unit train per day, with a maximum of 6 trains per week in and out of the facility.”).

³⁵ Proponent U.S. Oil Trading LLC, Transcor Astra Grp, subsid. of Compagnie Nationale a’ Portefeuille S.A. (CNP) (Belgium).

³⁶ Fielden, Sally, *Crude Loves Rock’n’Rail—West Coast Destinations*, RBN Energy, LLC, Apr. 10, 2013, located online 9/1/13, at <http://www.rbnenergy.com/crude-loves-rock-n-rail-west-coast-destinations>.

³⁷ Berth information: <http://www.usor.com/about/dock>. One pier accommodates tankers; one barges.

³⁸ Proponent Targa Resources & Phillips 66 Ferndale.

³⁹ Phillips 66 Press Release, March 20, 2013, located online 8/31/13, at http://www.phillips66.com/EN/newsroom/news_releases/2013NewsReleases/Pages/03-20-2013.aspx, announcing Bakken crude will be delivered to Targa for transfer to vessels bound to Phillips 66 Ferndale or San Francisco.

⁴⁰ Gilley, John, *Diversifying for Port of Tacoma’s Future*, The News Tribune, Feb. 3, 2013, located online 8/31/13, at <http://www.thenewstribune.com/2013/02/03/2460260/diversifying-for-ports-future.html>.

⁴¹ VEAT 2012 Vessel Entries And Transits for Washington Waters. Washington State Department of Ecology Spill Prevention, Preparedness and Response Program P.O. Box 47600 Olympia, WA 98504-7600. WDOE Publication 13-08-001, March 2013, available online as of Oct. 17, 2013, at <https://fortress.wa.gov/ecy/publications/SummaryPages/1308001.html>.

⁴² Rail service via Union Pacific and BNSF through GW Puget Sound & Pacific RR.

⁴³ Proponent Imperium Renewables. T-1's depth is <http://www.portofgraysharbor.com/terminals/terminal1.php>. MDNS issued 5/2/13 jointly by the City of Hoquiam and Wash. ECOL. SSDP issued 6/17/13; appeal pending, **hearing week of 9/30/13, before Shoreline Hearings Board**. http://www.portofgraysharbor.com/downloads/crude-by-rail/CBR_Fact_Sheet.pdf. Imperium Renewables produces pure, unblended B100 biodiesel. Port of Grays Harbor (PGH) will not grant a lease until all required permits are received from city, state, and federal governments. http://www.portofgraysharbor.com/downloads/crude-by-rail/Port_CBR_FAQ.pdf. Proponent does business as Imperium Term. Svcs., LLC. Rail carrier will be Union Pacific and BNSF through GW Puget Sound & Pacific RR. Port of Grays Harbor, *Grays Harbor Economic Opportunity: Crude by Rail*, Jan. 30, 2013, p.13, located online 8/30/13, at http://www.portofgraysharbor.com/downloads/crude-by-rail/CBR_Workshop_Presentation.pdf

⁴⁴ Volume was extrapolated from unit train estimates. *City of Hoquiam and Washington Department of Ecology Responsible Officials' Amendments to the Environmental Checklist and Threshold Determination for Imperium Bulk Liquid Facility Project*, May 2, 2013, p.3, located 8/30/13, at <http://www.cityofhoquiam.com/public-notice/imperium-proposal-mdns-and-ro-for-public.pdf> ("The company estimates that the terminal operations would consist of two unit trains per day, one loaded and one empty. Each unit train would consist of an average of 105 tank cars.").

⁴⁵ Product will be shipped out by some combination of tankers and barges. Port of Grays Harbor, *Frequently Asked Questions*, Aug. 7, 2013, located online 8/30/13, at http://www.portofgraysharbor.com/downloads/crude-by-rail/Port_CBR_FAQ.pdf. Vessel traffic could range from 75-300 vessels, depending on type and dwt, but 200 is the average given. *City of Hoquiam and Washington Department of Ecology Responsible Officials' Amendments to the Environmental Checklist and Threshold Determination for Imperium Bulk Liquid Facility Project*, May 2, 2013, p.3, located 8/30/13, at <http://www.cityofhoquiam.com/public-notice/imperium-proposal-mdns-and-ro-for-public.pdf> ("The company estimates that the terminal operations would consist of up to 200 ships or barges a year (400 entry and departure transits).")

⁴⁶ MDNS from City of Hoquiam and ECOL Mar. 2013. SSDP issued 4/26/13; appeal pending; **hearing week of 9/30/13, before Shoreline Hearings Board**. http://www.portofgraysharbor.com/downloads/crude-by-rail/CBR_Fact_Sheet.pdf. Port of Grays Harbor (PGH) will not grant a lease until all required permits are received from city, state, and federal governments. http://www.portofgraysharbor.com/downloads/crude-by-rail/Port_CBR_FAQ.pdf.

⁴⁷ Westway Terminal Company, LLC power point, Apr. 23, 2013, at 6, located online 8/30/13, at http://www.portofgraysharbor.com/downloads/crude-by-rail/Westway_GGHI_Presentation.pdf (proposing "expanding the terminal to allow [Westway] to receive and ship 9,600,000 barrels of crude oil per year").

⁴⁸ *Cit of Hoquiam and Washington Department of Ecology Responsible Officials' Amendments to the Environmental Checklist and Threshold Determination for Westway Terminal Tank Farm Expansion Project*. Located online 10/14/13, at <http://www.cityofhoquiam.com/public-notice/mdns-westway-apr04.2013.pdf>.

⁴⁹ Proponent US Development Group, LLC. T-3's depth is 38-40'. <http://www.portofgraysharbor.com/terminals/terminal3.php>. Proponent granted option to lease by PGH in Apr. 2013. Pending filing of permits after feasibility review by proponent. http://www.portofgraysharbor.com/downloads/crude-by-rail/CBR_Fact_Sheet.pdf.

⁵⁰ Grays Harbor Rail Terminal, *Proposed Facility at Port of Grays Harbor: Frequently Asked Questions*, located online 8/30/13, at http://www.portofgraysharbor.com/downloads/crude-by-rail/USD_FAQ.pdf.

⁵¹ *Id.* Proponent states "[s]hip calls will range from 45-60 per year, depending on vessel size."

⁵² Other possible proposals include:

- NuStar Energy, Tacoma or Vancouver. *New Traffic Patterns Emerge to Supply Crude Oil to West Coast Refiners*, EIA, Aug. 14, 2013, located online 9/2/13, at <http://www.eia.gov/oog/info/twip/twiparch/2013/130814/twipprint.html> ("[M]erchant terminal operators, such as ... NuStar Energy ... are also investing in new rail-to-barge and rail unloading facilities.") NuStar has three terminals, one in Tacoma and two in Vancouver. <http://www.nustarenergy.com>.
- Paramount Terminal, Portland, OR. The Wash. Dept. of Ecology lists this proposal on their *Energy Movement Evolution* map. <http://static.squarespace.com/static/50538902e4b06a8cd25aff1b/t/51a95db6e4b0c88fb1ffbae4/1370054070258/Ecology%20Map%20oilmovementjan713.pdf>. Possible proponent: Paramount Petroleum Corp. (503) 273-4760, <http://paramountasphalt.com/about-us>.

⁵³ Proponents LNG Development Company, LLC (d/b/a Oregon LNG) and Oregon Pipeline Company, LLC. <http://www.oregonlng.com/>, <http://www.oregonpipelinecompany.com/>.

⁵⁴ Terminal depth is 43', vessel numbers are for LNG (liquid natural gas) carriers. Source for number of vessels: *Oregon LNG Export Project Resource Report 1—General Project Description*, Docket Number PF12-18-000, Table 1.3-1, Aug. 2012, located online Oct. 15, 2013, at https://s3-us-west-2.amazonaws.com/oregonlng/pdfs/RR1_Prefiling_Draft_8-13-12/10LNG_RR1_PrefilingDraft_public.pdf.

⁵⁵ Proponent Coyote Island Terminals, LLC, a subsidiary of Ambre Energy, proponent of the Millennium Bulk Logistics Terminal in Longview. Coal would arrive by rail for storage and transfer to barges which would be towed to the shipping terminal at Port Westward. <http://www.nwp.usace.army.mil/Missions/Currentprojects/CoyoteIslandTerminal.aspx>.

⁵⁶ Proponent Tesoro-Savage; Rail service by Puget Sound and Pacific RR. Permitting lead agency: Wash. Energy Facility Site Evaluation Council (<http://www.efsec.wa.gov/default.shtm>, 360-664-1345), POC Stephen Posner, Compliance Mgr., sposner@utc.wa.gov, 664-1903. Governing law: RCW § 80-50-020. 10/1/13 approx. date of announcement of pre-scoping review.

⁵⁷ http://tesorosavagevancouver.com/here/wp-content/uploads/2013/08/POV_FactSheet.pdf.

⁵⁸ Proponent Global Partners, LP.

⁵⁹ Source: de Place, Eric, *Sightline Report: The Northwest's Pipeline on Rails: Crude Oil Shipments Planned for Puget Sound, the Washington Coast, and the Columbia River*, (Aug. 2013 Update), fn.20, located 8/29/13 at http://www.sightline.org/wp-content/uploads/downloads/2013/07/crude-oil-by-rail_August-Update.pdf.